

Insulated Gate Bipolar Transistor

Features

- ❑ Low voltage drop at high currents
- ❑ Optimized for use with the Supertex SR03x Inductorless Off-Line Switcher
- ❑ Industry standard TO-252 (D-Pak) package
- ❑ 700V breakdown voltage rating

Applications

- ❑ White goods
- ❑ Small appliances
- ❑ Lighting controls
- ❑ Motor drives
- ❑ Meter readers
- ❑ Small off-line power supplies

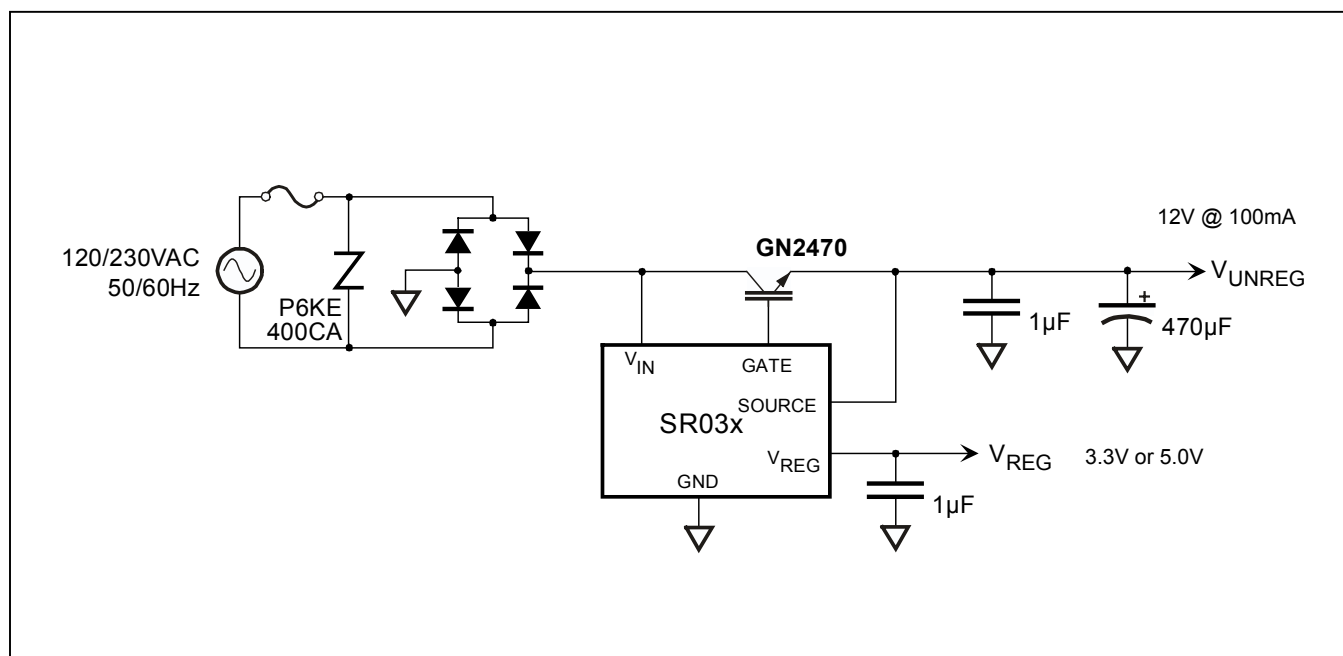
Description

The Supertex GN2470 is a 700V, 3.5 amp insulated gate bipolar transistor (IGBT) that combines the positive aspects of both BJTs and MOSFETs.

The GN2470 IGBT has lower on-state voltage drop with high blocking voltage capabilities and features many desirable properties including a MOS input gate, low conduction voltage drop at high currents.

The GN2470 is designed to work with the Supertex SR03x inductorless dual output off-line regulators. See the SR03x datasheet for details.

Typical Application



Rev. B – 4-22-04

Ordering Information

Device	Package Options
	D-Pak*
GN2470	GN2470K4

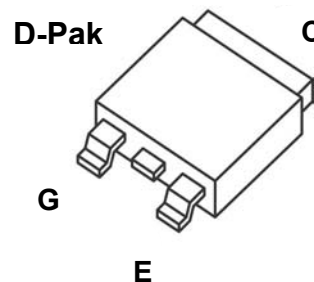
* Only available in 2000 piece Tape & Reel

Absolute Maximum Ratings

Collector-to-Emitter Voltage	700V
Gate-to-Emitter Voltage	+/-20V
Operating Junction and Storage Temperature Range T_J and T_{STG}	-55°C to +150°C
Soldering Temperature*	300°C

*Distance if 1.6mm from case for 10 seconds.

Package Option



Thermal Characteristics

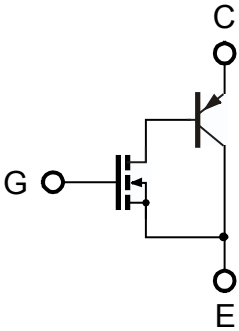
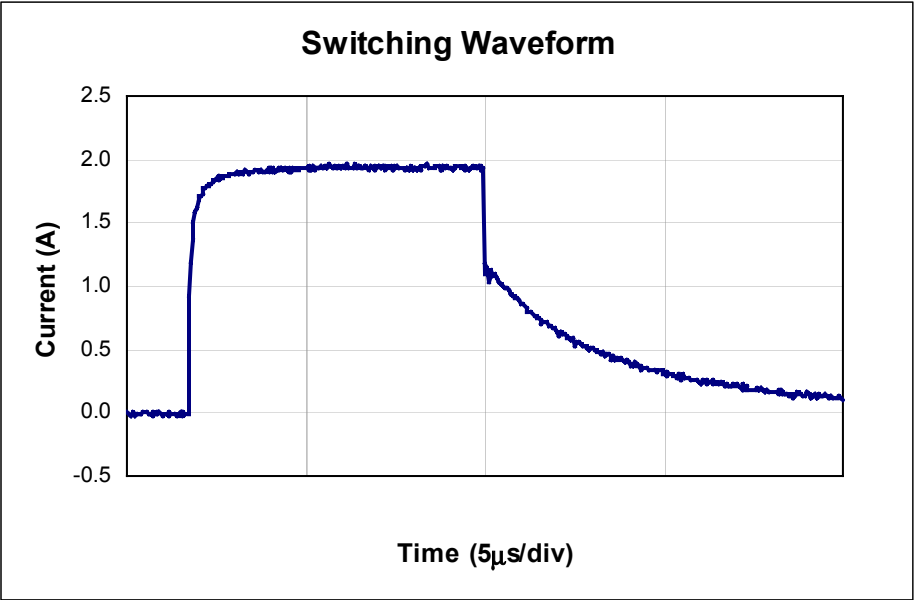
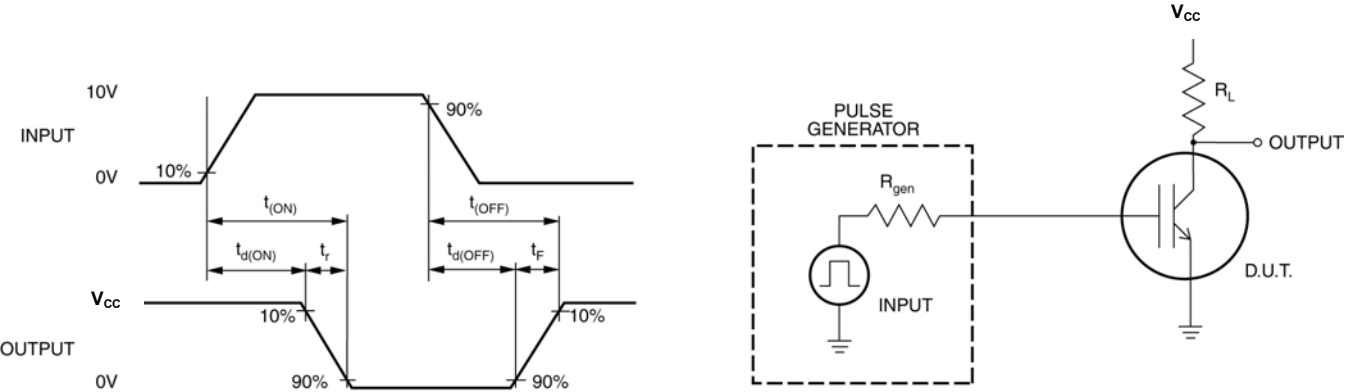
Package	I _c (continuous)	I _c (pulsed)	Power Dissipation @ $T_A = 25^\circ\text{C}$	θ_{ja} °C/W	θ_{jc} °C/W
D-Pak	1.0A	3.5A	2.5W	60*	10

*When mounted on FR4 board, 25mm x 25mm x 1.57mm

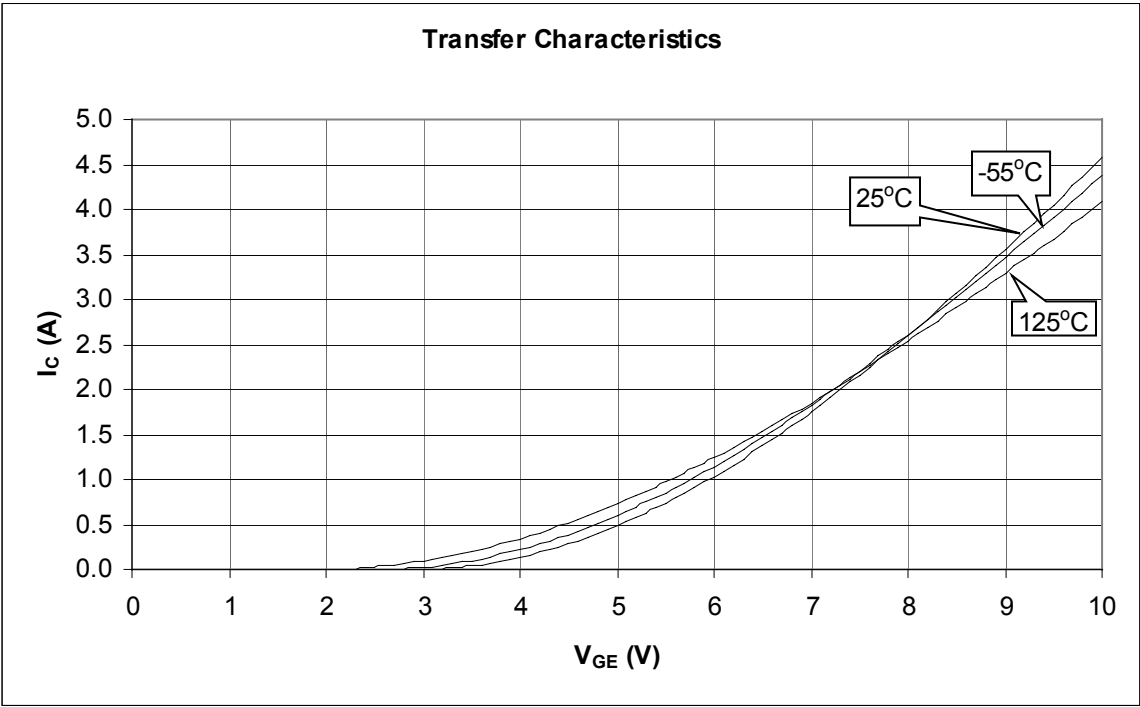
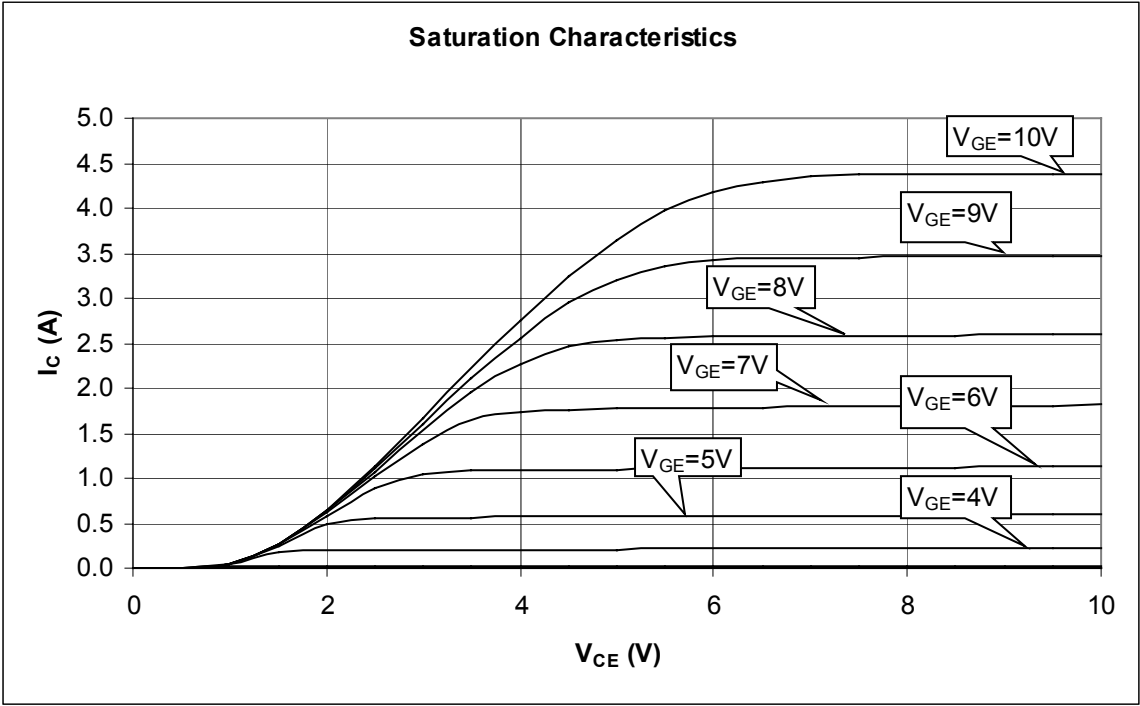
Electrical Characteristics (at $T_A=25^\circ\text{C}$, unless otherwise specified)

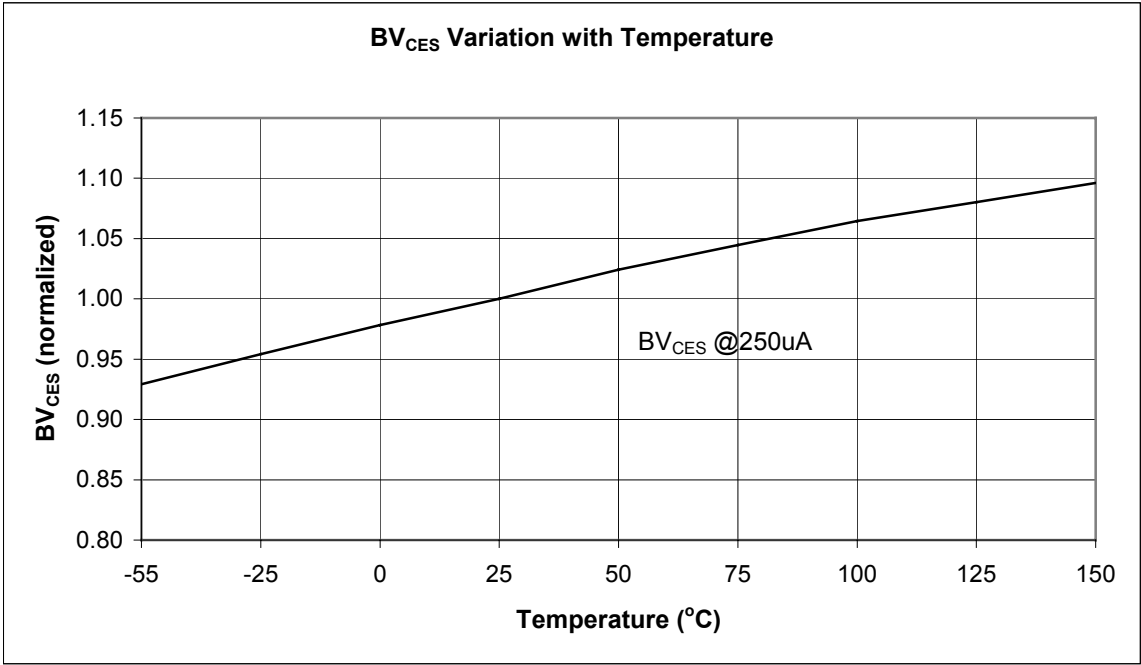
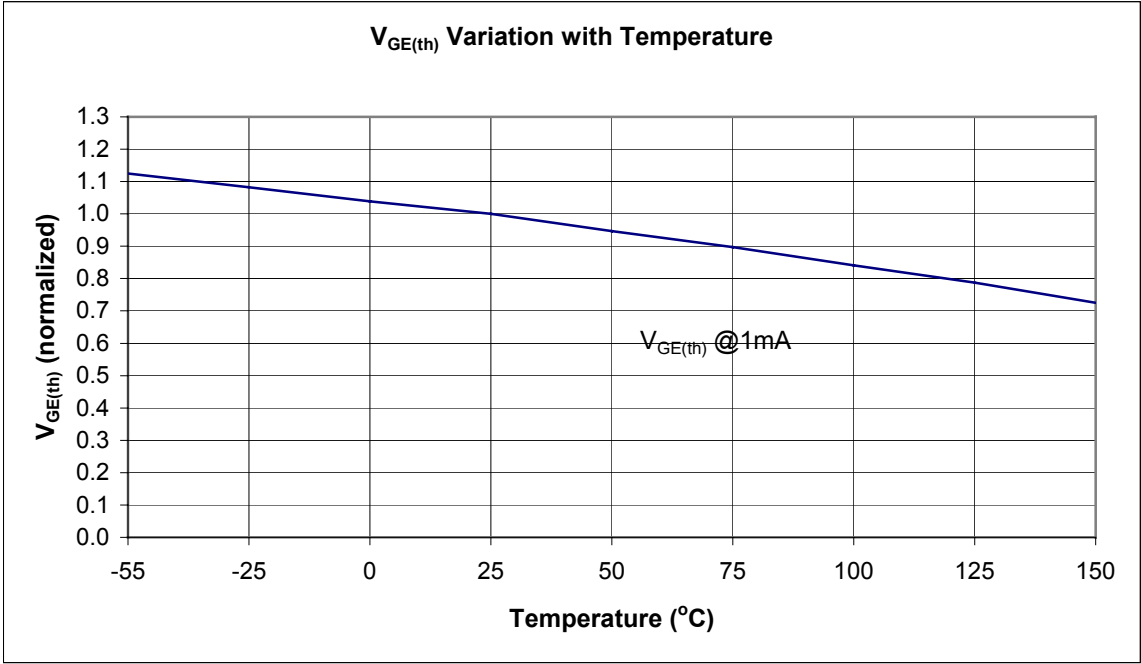
Symbol	Parameter	Min	Typ	Max	Units	Conditions
BV_{CES}	Collector-Emitter Breakdown Voltage	700	-	-	V	$V_{GE} = 0V, I_C = 250\mu A$
BV_{ECS}	Emitter-Collector Breakdown Voltage	-6	-10		V	$V_{GE} = 0V, I_C = 1mA$
$V_{GE(th)}$	Gate Threshold voltage	1.5	-	3.5	V	$V_{CE} = V_{GE}, I_C = 1mA$
V_{CE}	Collector-Emitter Voltage Drop	-	4.5	5.0	V	$I_C = 3A, V_{GE} = 13V$
g_{fe}	Forward Transconductance	0.5	0.8	-	mho	$V_{CE} = 25V, I_C = 2A$
I_{CES}	Zero Gate Voltage Collector Current	-	-	100	μA	$V_{GE} = 0V, V_{CE} = 600V$
I_{GES}	Gate-Emitter Leakage Current	-	-	± 100	nA	$V_{GE} = \pm 20V, V_{CE} = 0V$
$I_{C(on)}$	On-State Collector Current	3.0	4.0	-	A	$V_{GE} = 10V, V_{CE} = 25V$
$t_{d(on)}$	Turn-on delay time	-	8.0	15.0	ns	$V_{CC} = 25V$ $R_{GEN} = 25\Omega$ $R_L = 11\Omega$
t_r	Rise time	-	400	600	ns	
$t_{d(off)}$	Turn-off delay time	-	20	50	ns	
t_f	Fall Time	-	7000	12000	ns	
C_{ies}	Input Capacitance	-	100	150	pF	$V_{CE} = 25V$ $V_{GE} = 0V$ $f = 1MHz$
C_{oes}	Output Capacitance	-	12	25	pF	
C_{res}	Reverse Transfer Capacitance	-	2	5	pF	

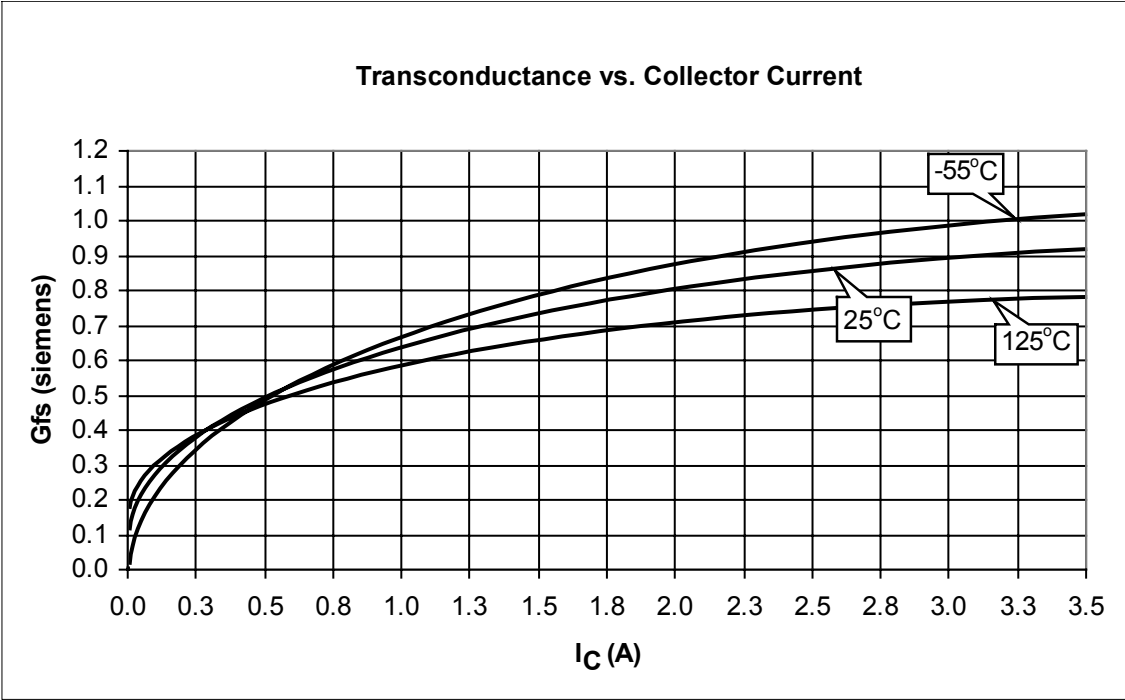
Switching Waveforms and Test Circuit



Equivalent Circuit

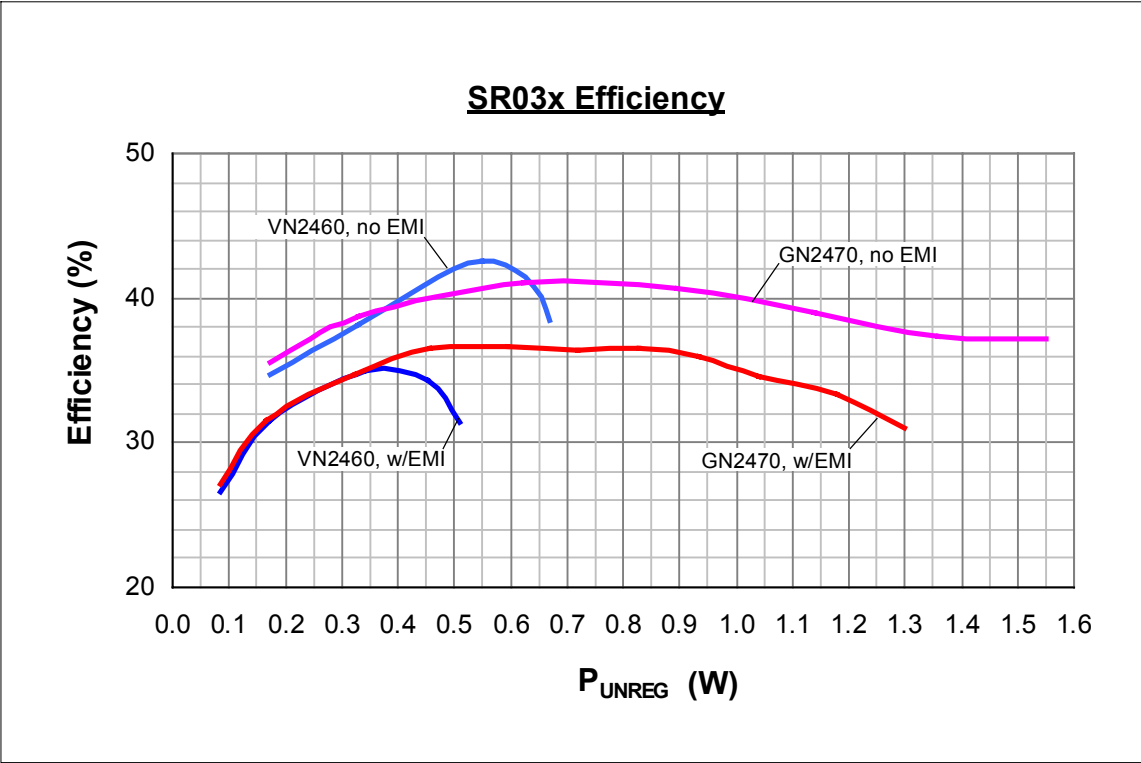


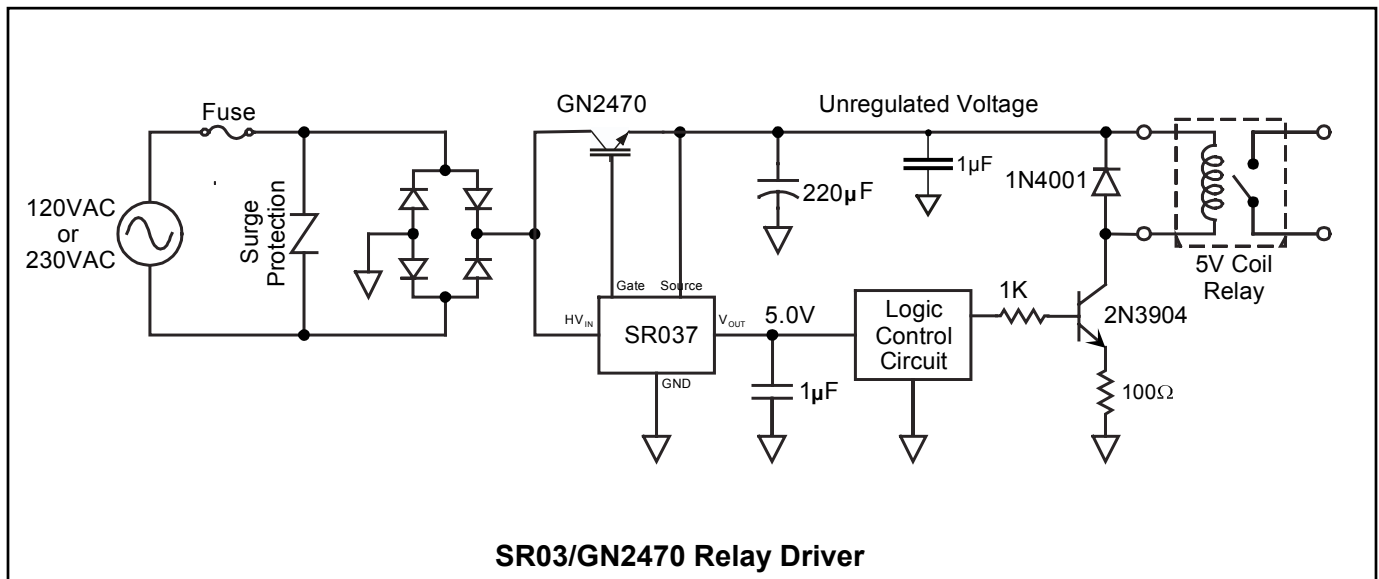
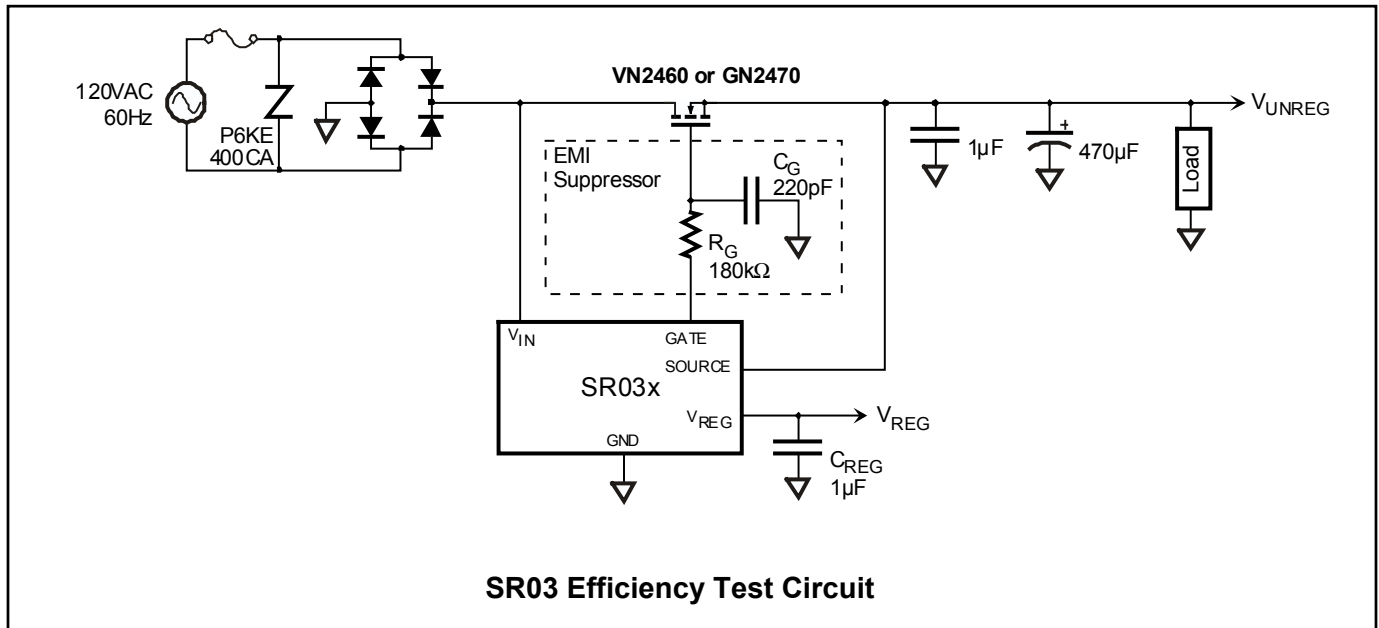




Application

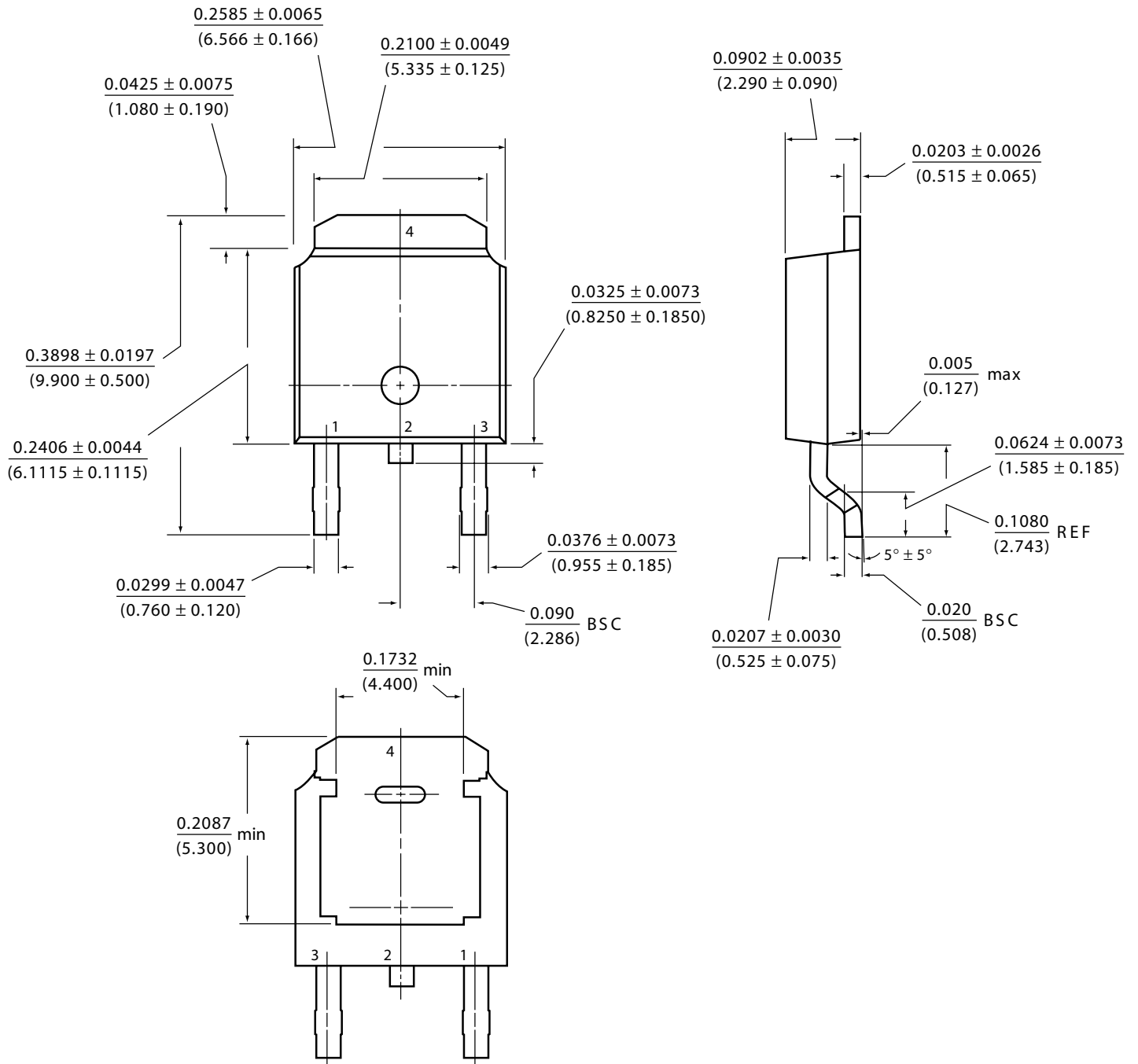
Using the GN2470 IGBT in place of a MOSFET improves the performance of SR03x-based power supplies.





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T0-252 (DPAK: K4)



Note: Circle (e.g. Ⓑ) indicates JEDEC Reference.

Measurement Legend = $\frac{\text{Dimensions in Inches}}{\text{(Dimensions in Millimeters)}}$